Aura Validation Experiment
Science Flight #6 Summary Report
November 9, 2004

Flight Objective:

Provide: (1) Remote sensing observations for TES "step & stare" observational points in a latitudinal profile from Gulf of Mexico to Alabama-Mississippi border and (2) Remote sensing observations for OMI scans of low level clouds. TES observational points are 5x8 km fields of view that are spaced every 31 km directly along planned flight track.

Flight Summary:

The WB-57 flew along the Aura suborbital track over the Gulf of Mexico to a point near the Mississippi-Alabama border. We then turned northeastward and descended to 20,000 feet over Huntsville, Alabama. Then a spiral ascent was completed to 56,000 from 20,000 feet over Huntsville. The Aura satellite made its overpass at 1914 UT.

The overflight of Huntsville was (1) temporally coincident and almost spatially coincident with the MLS profile location, and (2) bracketed by two ozonesonde launches by the University of Alabama at Huntsville.

All of the WB-57F instruments worked well and collected data on today's flight.

Weather information is available in Figures 2-4.

Flight Profile (see Figure 1)

Takeoff: 9:55 CST
Landing: 15:17 CST
Duration: 5.4 hrs

Point 3: N27º 36' W87º 02'
Point 4: N30º 27' W87º 02'
Point 5: N33º 27' W88º 37'
Point 6: N34º 43' W86º 39'

Aircrew: Rick Hull, Pilot, and Brian Barnett, Backseater

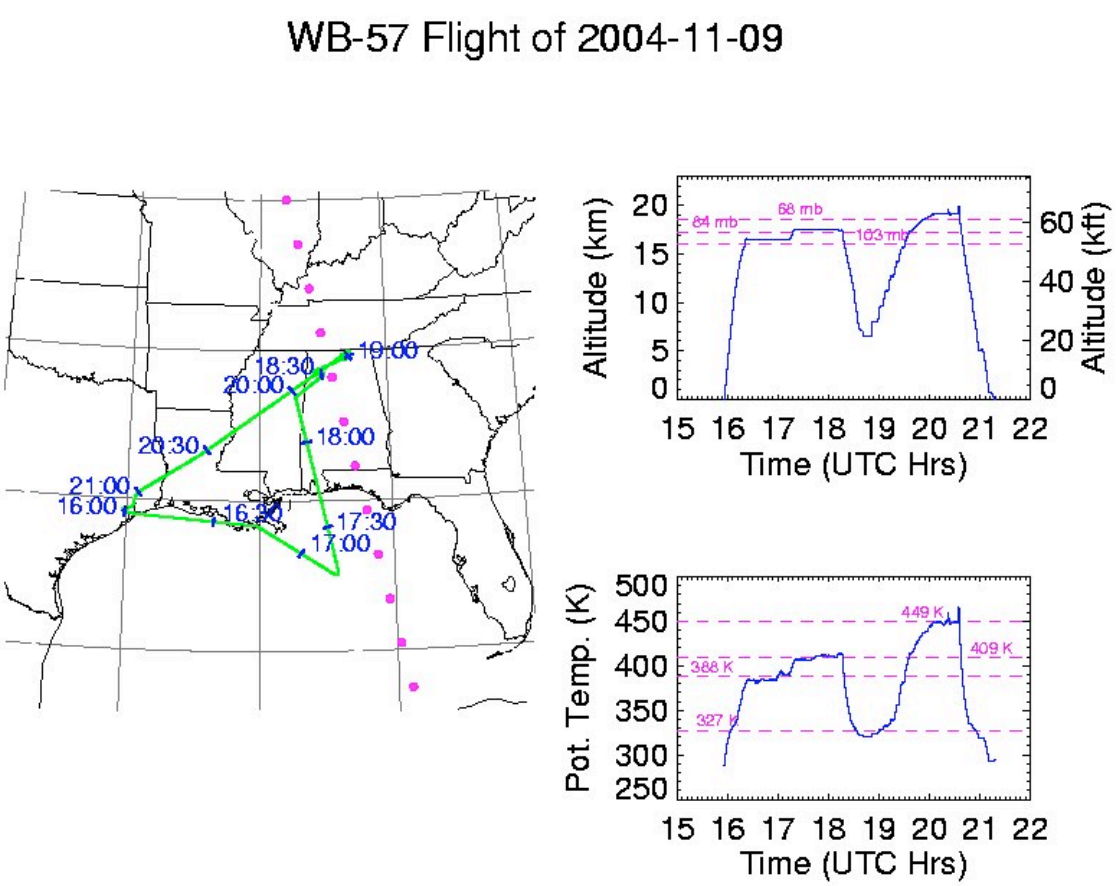

Figure 1 – Flight Profile

(Left) Map of WB-57F flight track (in green) with every half-hour marked. Aura nadir (faint cyan points) and MLS tracks (magenta points) are indicated.
(Upper Right) Plot of pressure altitude vs. time with the principal pressure levels of the flight marked.
(Lower Right) Plot of potential temperature vs. time with the principal theta levels of the flight marked.

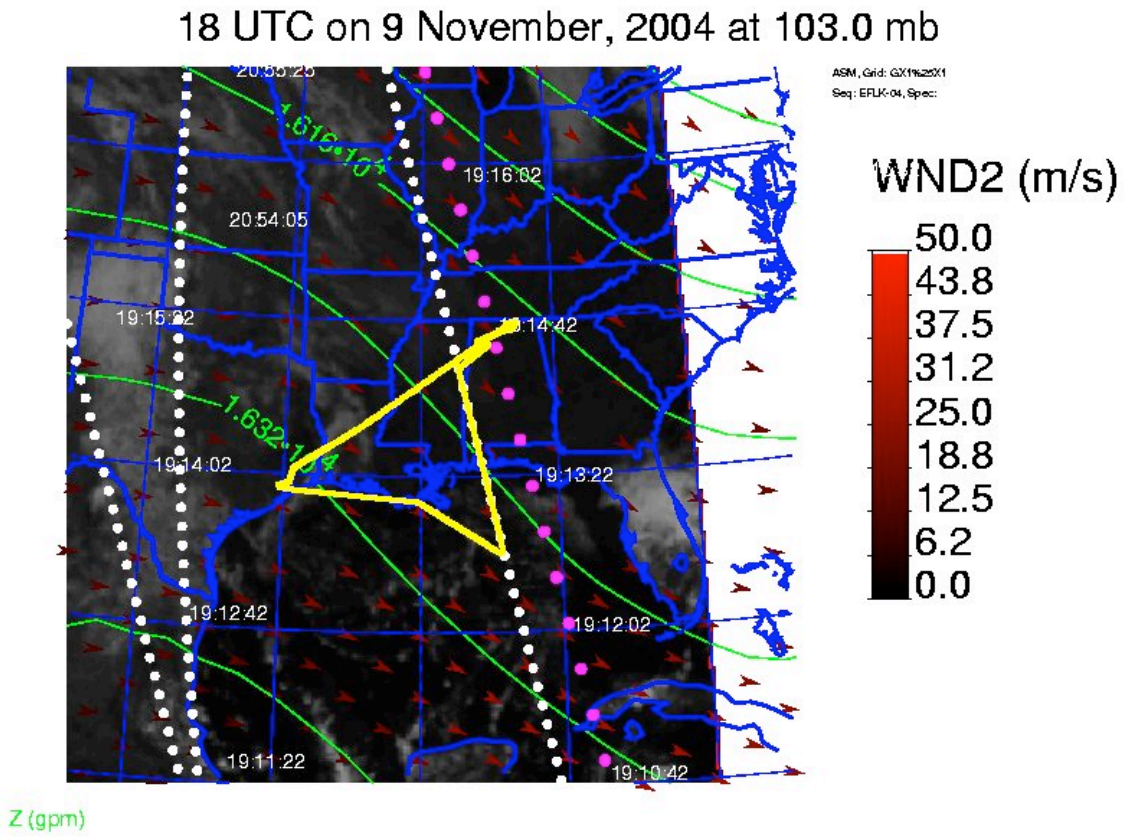

Figure 2 – GOES Visible Image

Flight track (yellow line) superimposed on meteorological fields. The grayscale image is the GOES-12 visible channel satellite image. The red arrows and green lines are the winds (WND2) and the geopotential heights (Z) at the principal pressure level at which the aircraft spent the most time. Values are from the GSFC GMAO assimilation analyses. The Aura nadir (cyan) and MLS tracks (magenta) are shown, with times along the ground track indicated.

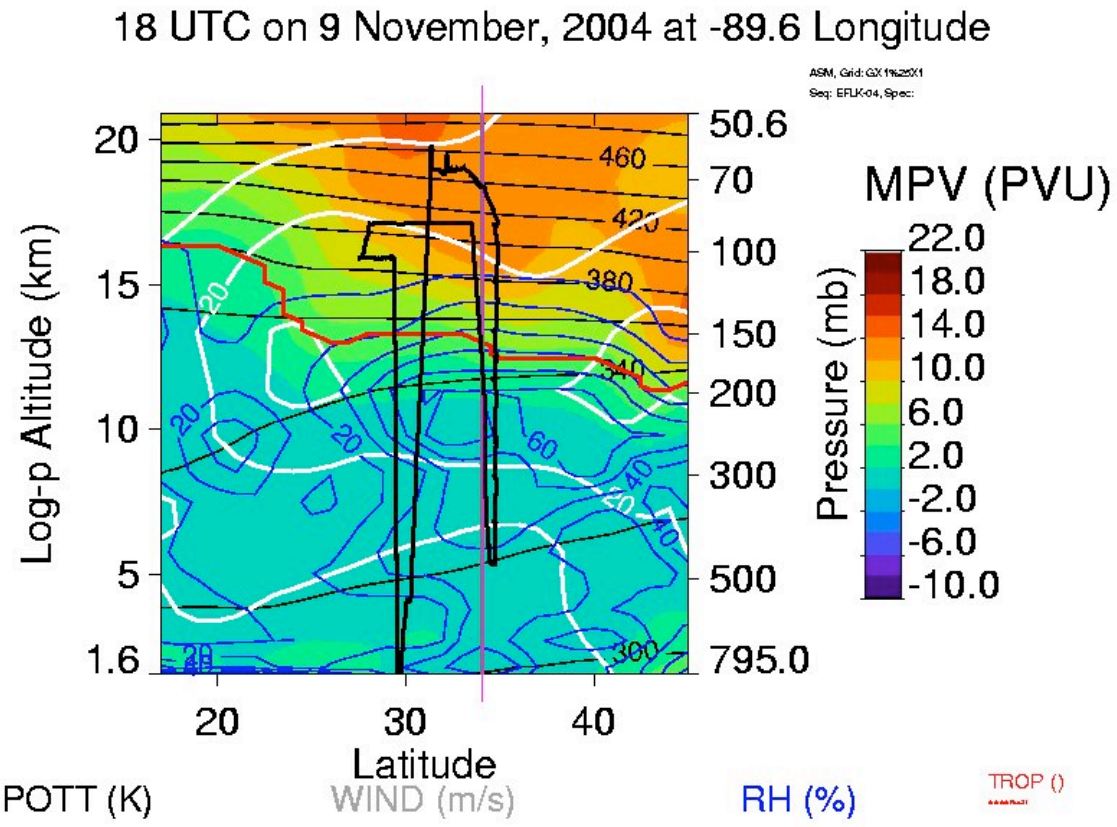

Figure 3 – Latitude Height Cross Section

Latitude-pressure cross-section of meteorological fields during the flight. The colored image represents modified potential vorticity (MPV); also shown are potential temperature (POTT) (thin black lines), wind speed (WIND) (white lines), relative humidity (RH) (blue lines), and the PV tropopause (TROP) (red line). The thick black lines mark the aircraft position and the vertical lines mark the positions of nearby MLS profiles.

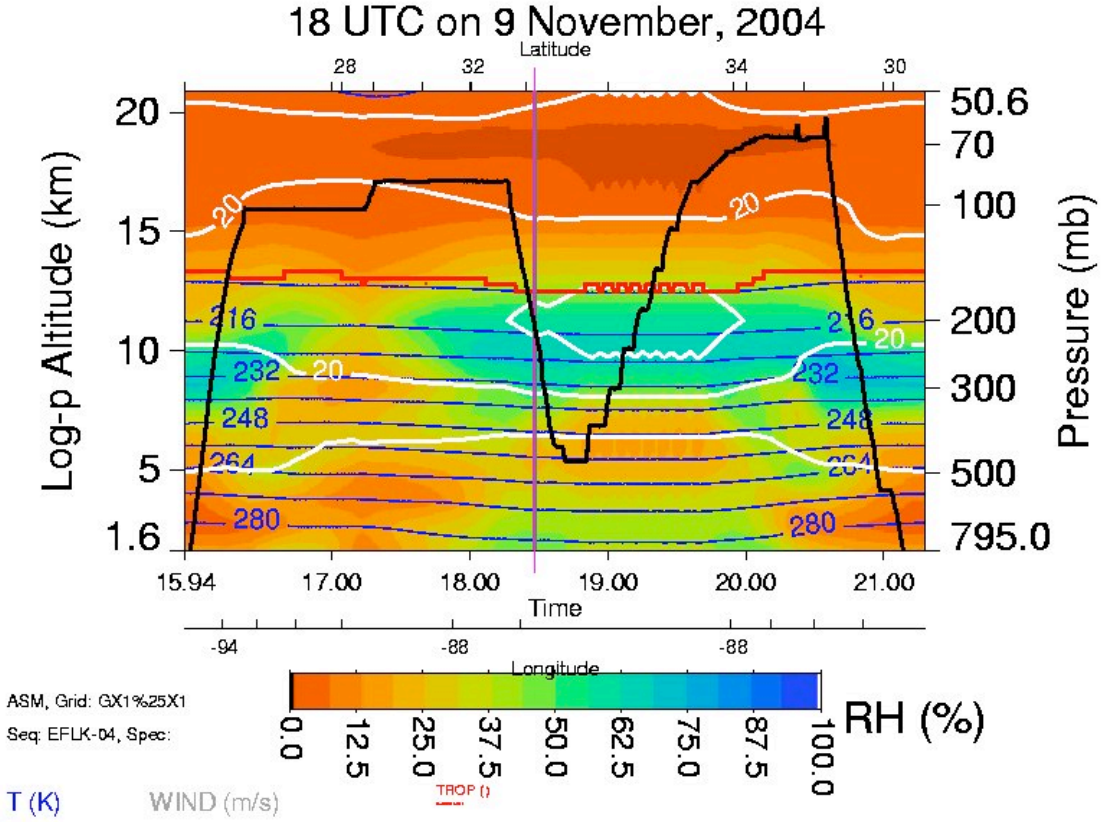

Figure 4 – Curtain Plot

Time-pressure "curtain" plot of meteorological vertical profiles along the flight track. The colored image represents relative humidity; also shown are temperature (T) (blue lines), wind speed (WIND) (white lines), and the PV tropopause (TROP) (red line). The thick black lines mark the aircraft position and the vertical lines mark the positions of nearby MLS profiles.